

CLAIMS

1. A polynucleotide coding for human lactoferrin, characterized in that it has a sequence totally or partially corresponding to the sequence reported in the annexed sequence listing as SEQ ID NO:1, said sequence being optimized for the in plant expression.

2. The polynucleotide according to claim 1, wherein said polynucleotide has fused at the 5'-terminus the leader sequence of 7s basic globulin gene or the leader sequence of  $\beta$ -conglycinine gene

3. The polynucleotide according to claim 2, wherein said leader sequence is the sequence reported in the annexed sequence listing as SEQ ID NO: 13 or the sequence reported in the annexed sequence listing as SEQ ID NO: 14.

4. A recombinant DNA vector comprising the polynucleotide according to any of claims 1 to 3 operatively linked to regulation elements allowing the expression of said polynucleotide.

5. The recombinant DNA vector according to claim 4, wherein said regulation elements is a plant expression cassette allowing the tissue specific expression of said polynucleotide.

6. The vector according to claim 5, wherein said plant expression cassette includes the promoter of the gene coding for the protein basic globulin 7 S.

7. The vector according to claim 6, wherein said promoter has the sequence reported in the annexed sequence listing as SEQ ID NO:21

8. The vector according to claim 6 or 7, wherein said plant expression cassette includes the leader sequence of the gene coding for the protein basic globulin 7 S.

9. The vector according to claim 8, wherein said leader sequence is the sequence reported in the annexed sequence listing as SEQ ID NO: 13.

10. The vector according to claim 5, wherein said plant expression cassette includes the promoter of the gene coding for  $\beta$ -conglycinine protein.

5 11. The vector according to claim 10, wherein said promoter has the sequence reported in the annexed sequence listing as SEQ ID NO:22.

10 12. The vector according to claim 10 or 11, wherein said plant expression cassette includes the leader sequence of the gene coding for the  $\beta$ -conglycinine protein.

13. The vector according to claim 12, wherein said leader sequence is the sequence reported in the annexed sequence listing as SEQ ID NO: 14.

15 14. A vegetal cell including the polynucleotide according to any of claims 1 to 3.

15. A vegetal cell including the vector according to any one of the claims 4 to 13.

20 16. A cellular aggregation obtainable from cells according to claim 14 or 15.

17. The cellular aggregation according to claim 16, wherein said aggregations are calluses capable of regenerating transgenic plants.

25 18. A transgenic plant including in a tissue cell the polynucleotide according to any of claims 1 to 3.

19. The transgenic plant according to claim 18, wherein said tissue cell is a storage tissue cell.

20. The transgenic plant according to claim 18, wherein said tissue cell is a fruit tissue cell.

30 21. The transgenic plant according to any of claims 18 to 20, said plants being selected from the group consisting of solanaceae, cereals, leguminosae, fruit bearing plants and horticultural plants.

35 22. The transgenic plant according to claim 21, said plant being selected from the group consisting of Soya, tobacco and rice.

23. Use of the vector according to any of claims 4 to 13 for the transformation of vegetal cells.

24. Use of the transgenic plant according to any one of the claims 18 to 22, for the production of nutraceuticals.

5 25. Use of the transgenic plant according to any of claims 18 to 22, for the production of human lactoferrin.

26. Use of the transgenic plant according to any one of claim 18 to 22, for the production of lactoferrin flours or of lactoferrin extracts obtained from tissues of said transgenic plant.

10 27. Use of the transgenic plant according to any one of the claims 18 to 22 for the production of functional foods containing lactoferrin.

15 28. The use according to claim 27, wherein said functional food is selected from the group consisting of vegetal milks, fruit juices, fruit and/or vegetable homogenized foods.

20 29. A plant expression cassette allowing the tissue specific expression of a gene of interest comprising the promoter of the gene coding for the protein basic globulin 7 S.

30. The plant expression cassette according to claim 29, wherein said promoter has the sequence reported in the annexed sequence listing as SEQ ID NO:21

25 31. The plant expression cassette according to claim 29 or 30, wherein said plant expression cassette includes the leader sequence of the gene coding for the protein basic globulin 7 S.

30 32. The plant expression cassette according to claim 31, wherein said leader sequence is the sequence reported as SEQ ID NO: 13.

33. A recombinant DNA vector comprising a gene of interest under the control of the plant expression cassette according to any of claims 29 to 32.

35 34. The vector according to claim 33 when depending on claim 31 or 32, wherein said gene of interest is fused to the leader sequence.

03-11-2000

58

35. A plant expression cassette allowing the tissue specific expression of a gene of interest comprising the promoter of the gene coding for the  $\beta$ -conglycinine protein.

5 36. The plant expression cassette according to claim 35, wherein said promoter has the sequence reported in the annexed sequence listing as SEQ ID NO:22

10 37. The plant expression cassette according to claim 35 or 36, wherein said plant expression cassette includes the leader sequence of the gene coding for the leader sequence of the gene coding for the  $\beta$ -conglycinine protein.

15 38. The plant expression cassette according to claim 37, wherein said leader sequence is the sequence reported as SEQ ID NO: 14.

39. A recombinant DNA vector comprising a gene of interest under the control of the plant expression cassette according to any of claims 35 to 38.

20 40. The vector according to claim 39 when depending on claim 37 or 38, wherein said gene of interest is fused to the leader sequence.

41. A vegetal cell including the vector according to any one of the claims 33, 34, 39 or 40.

25 42. A cellular aggregation obtainable from the cell according to claim 41.

43. The cellular aggregation according to claim 42, said aggregations being calluses capable of regenerating transgenic plants.

30 44. A transgenic plant including in a tissue cell the vector according to any of claims 33, 34, 39 or 40.

45. The transgenic plant according to claim 44, wherein said tissue cell is a storage tissue cell.

46. The transgenic plant according to claim 44, wherein said tissue cells is a fruit tissue cell.

35 47. The transgenic plant according to any of claim 43 to 45, said plants being selected from the group

